

COURSE HANDOUT FOR INTRODUCTION TO FOREST GARDENING

Compiled by Jess Clynewood and Rich Wright

Held at Coed Hills Rural Art Space 2010



ETHICS AND PRINCIPLES OF PERMACULTURE

Care for the Earth ❖ Care for the people ❖ Fair shares

PRINCIPLES

Make the least change for the greatest effect ❖ Mistakes are tools for learning ❖ The only limits to the yield of a system are imagination and understanding

Observation – Protracted and thoughtful observation rather than prolonged and thoughtless action. Observation is a key tool to re-learn. We need to know what is going on already so that we don't make changes we will later regret.

Use and value diversity - Diversity allows us to build a strong web of beneficial connections. Monocultures are incredibly fragile and prone to pests and diseases – diverse systems are far more robust and are intrinsically more resilient.

Relative Location and Beneficial Connections – View design components not in isolation but as part of a holistic system. Place elements to maximise their potential to create beneficial connections with other elements.

Multi-functional Design – Try and gain as many yields or outputs from each element in your design as possible. Meet every need in multiple ways, as many elements supporting each important function creates stability and resilience.

Perennial systems – minimum effort for maximum gain

Create no waste - The concept of waste is essentially a reflection of poor design. Every output from one system could become the input to another system. We need to think cyclically rather than in linear systems. Unmet needs = work, unused output = pollution.

Stacking – Make use of vertical as well as horizontal space, filling as many niches as possible.

Maximise Edge – The edge is the place where two environments meet, and is usually the most diverse and productive area of any system.

The problem is the solution – Turn constraints into resources. We are surrounded by insurmountable opportunities!

80/20 – put in 80% of your total energy into design and implementation. A properly designed system should be able to run on very low maintenance once implemented.

Appropriate scale – design small, self-replicating systems. The smaller and more intensive they are, the more resilient they will be.

Imagination and information (or lack of) are the only limits to yield

We live in a universe of infinite possibilities! Turn constraints into resources. We are surrounded by insurmountable opportunities.

MULCHING

Mulching is one of the simplest and most beneficial practices you can use in the garden. Mulch is simply a protective layer of a material that is spread on top of the soil. Mulches can either be organic - such as grass clippings, straw, bark chips, and similar materials - or inorganic - such as stones, brick chips, and plastic. Both organic and inorganic mulches have numerous benefits. The main functions of mulching are:

- To kill weeds by denying them light
- To retain moisture in the soil over summer
- To protect the soil from erosion
- To add fertility to the soil

There are three different types of mulch:

1. Clearance mulch – to clear a site of perennial weeds before planting
2. Grow through mulch – to suppress perennial weeds at the same time as growing crops through holes in the mulch
3. Maintenance mulch – this is applied once the garden is established, to keep down weeds and retain moisture

Clearance Mulch

A clearance mulch will need to be applied for at least a full season before planting begins. The clearance mulch works by denying weeds sunlight, which they need in order to grow. So a clearance mulch is most effective when in place over a full growing season – a mulch from spring to autumn will probably kill about 90% of all perennial weeds, without the need for digging.

Materials appropriate for a clearance mulch:

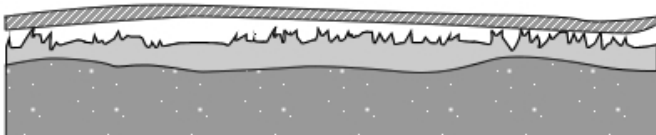
Black plastic – perfect for a clearance mulch. Energy intensive to produce, so try and recycle it instead of buying it new. It will degrade in the sun, so cover it with wood chip to make it last longer. Can be dug in round the edges or weighted down with planks etc.

Old Carpet – can usually be found easily in skips if you live in a city. If the carpet has a nylon backing, the carpet will rot down and leave millions of tiny nylon threads in your soil – not ideal! So try and make sure that any carpet used is 100% natural fibres.

Cardboard – will rot after one season, but is just as effective and completely bio-degradable.

CLEARANCE MULCH

Use black plastic sheeting or carpet to totally block light to the grass or weed layer.



Grow Through Mulch

Similar to a clearance mulch, but with holes for plants to grow through. This system is suitable for sites that don't have a big problem with perennial weeds, as weeds will still be able to grow up through the holes for the plants. The advantage of this system is that you don't have to wait for a whole growing season to begin planting.

Method:

1. Plant trees and shrubs straight into the soil
2. Cover the ground you want to mulch with a thick layer of newspaper or cardboard, making sure to overlap the pieces.
3. Add manure, compost, or any other biodegradable material which contains plant nutrients.
4. Where you want to plant a vegetable, make a hole in the cardboard layer and scrape away the manure from the hole. Replace it with a double handful of compost, and plant the vegetable into the compost. The roots of the vegetable will find their way through the hole in the cardboard on their own.
5. You can choose to cover the manure with another mulch material like woodchip. This looks more attractive, and stops the manure drying out over the summer, but it can also harbour slugs in wet weather.

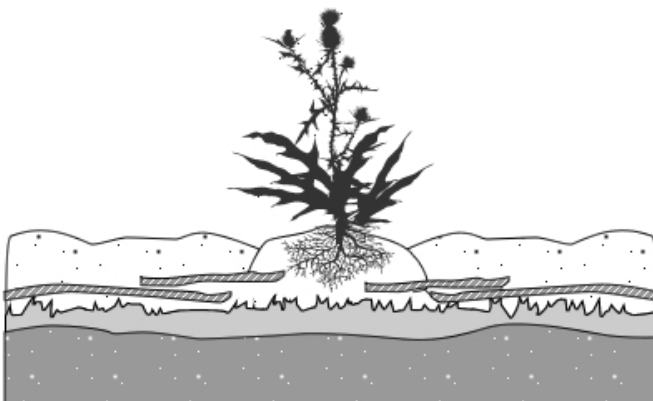
If you want to sow a living mulch or ground cover using the grow through method, you need to cover the layer of cardboard with a thick layer of compost, and then sow straight into that. Plants grown from seed in this way may have a problem with slugs hiding under the cardboard – but if you don't have a big slug problem it should work fine.

Materials for a grow through mulch

Cardboard – large sheets of cardboard are perfect for this type of mulching. The boxes that bicycles, washing machines and plasma TV's come in are ideal. Try asking what day the recycling is collected from a local retail park, and turning up the day before it gets collected. In our experience, Halfords and Comet have been extremely helpful!

GROW THROUGH MULCH

Use cardboard to totally block light to the grass or weed layer, then cover cardboard layer with manure. When planting create a hole through the mulch and create a mound of compost to plant into.



Maintenance mulch

In comparison with clearance and grow through mulches, which are one off operations for breaking new ground, a maintenance mulch can be used regularly in any garden. Its main use is to control weeds, but it also has many other advantages –

- Keeps weeds down
- Retains water in the soil
- Protects bare soil from erosion from wind, rain and sun
- Supplies the soil with nutrients without the need to dig them in
- Keeps the soil warm in winter

The disadvantages of using a maintenance mulch are –

- It can harbour slugs
- Can prevent light rain from penetrating the soil
- Slows the warming up of the soil in Spring.

The advantages to using a maintenance mulch are many, and the disadvantages can be reduced by careful management –

Slugs

Despite the fact that many of us accept that extra slug damage is an unfortunate effect of mulching, research by the Henry Doubleday Research Association is inconclusive as to whether mulching actually does increase slug damage. In some of their test sites slug damage was recorded as rising due to mulching, and in others it did not – in fact in some sites slug damage was higher where the ground had been dug. This may be because although the mulch provides pest with a hiding place, it also shelters their predators. Since pest predator populations rise more slowly than that of the pests, this problem should reduce as the garden matures. If there is a problem with pests overwintering in mulches, then mulch layers can be drawn back over winter.

Rain penetration

Mulch layers can absorb light rain and allow it to evaporate before it has reached the soil. This is only really a problem if mulch is applied over a dry soil – this can be remedied by making sure the ground is wet before mulching over the top. Heavy winter rain will penetrate even the thickest of mulches, so any ground will be thoroughly moist in spring at the beginning of the growing season.

Temperature

The effect of mulch is to even out the temperature of the ground over the year. In winter, it insulates the soil and keeps it warm. In summer it protects the ground from the harsh heat of the sun. Plants generally like stable conditions, so the effect of slowing the warming of the ground in spring is counterbalanced by the evening out effect being generally beneficial to plants.

Materials for maintenance mulches

Straw – Excellent around soft fruit such as strawberries for keeping down weeds and keeping fruit off the soil. Often old, wet bales can be obtained for free from farms around June/July just before the new harvest.

Wood chip – Can lock up soil nitrogen if mixed with the soil, so care needs to be taken that it remains on top of the soil and is not mixed in.

Bracken – is excellent as it is slow to rot down and can inhibit the germination of weed seeds.

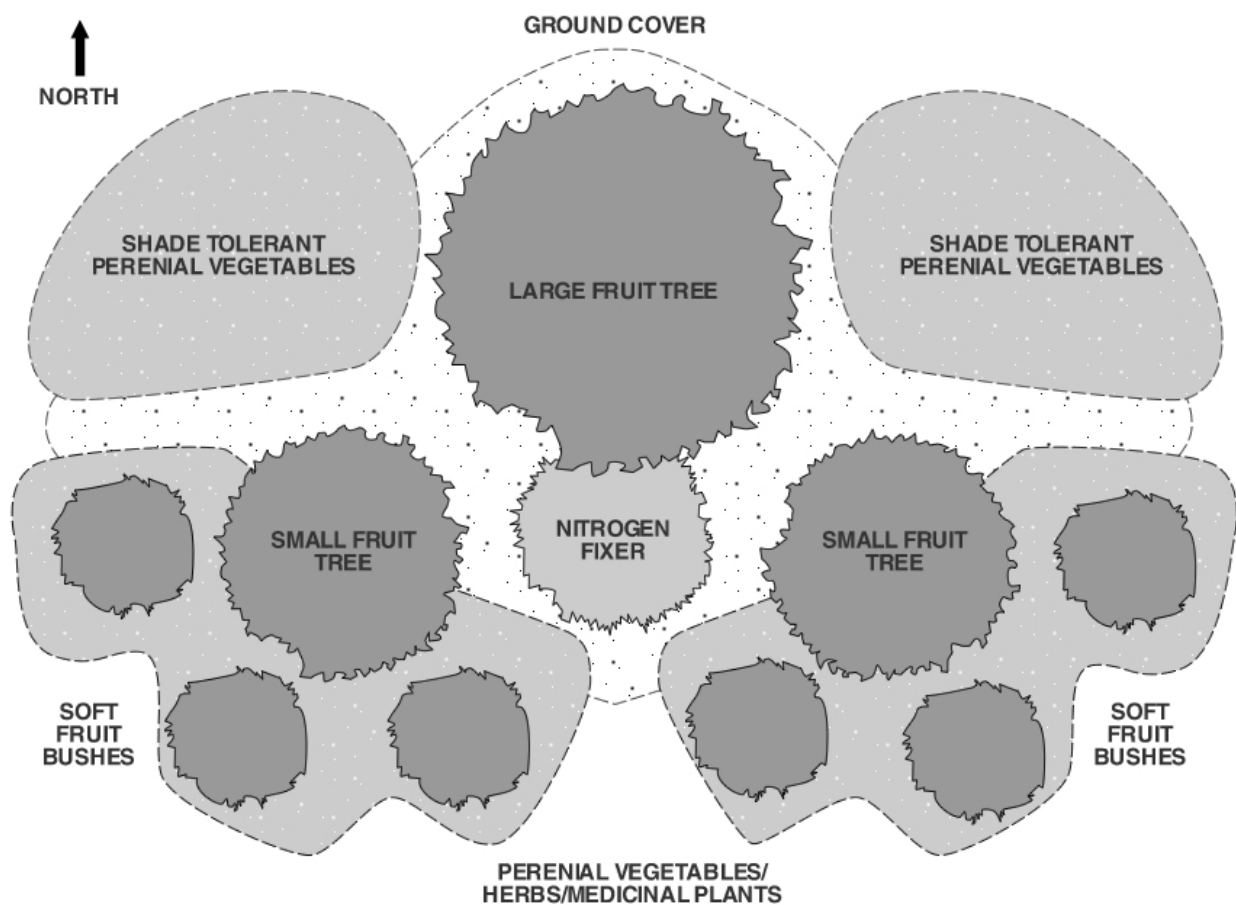
Grass cuttings – Can rot down to produce a slimy mess if applied on their own in anything more than a thin layer. If mixed with something to keep them open, like leaves, they are fine and a good source of nitrogen.

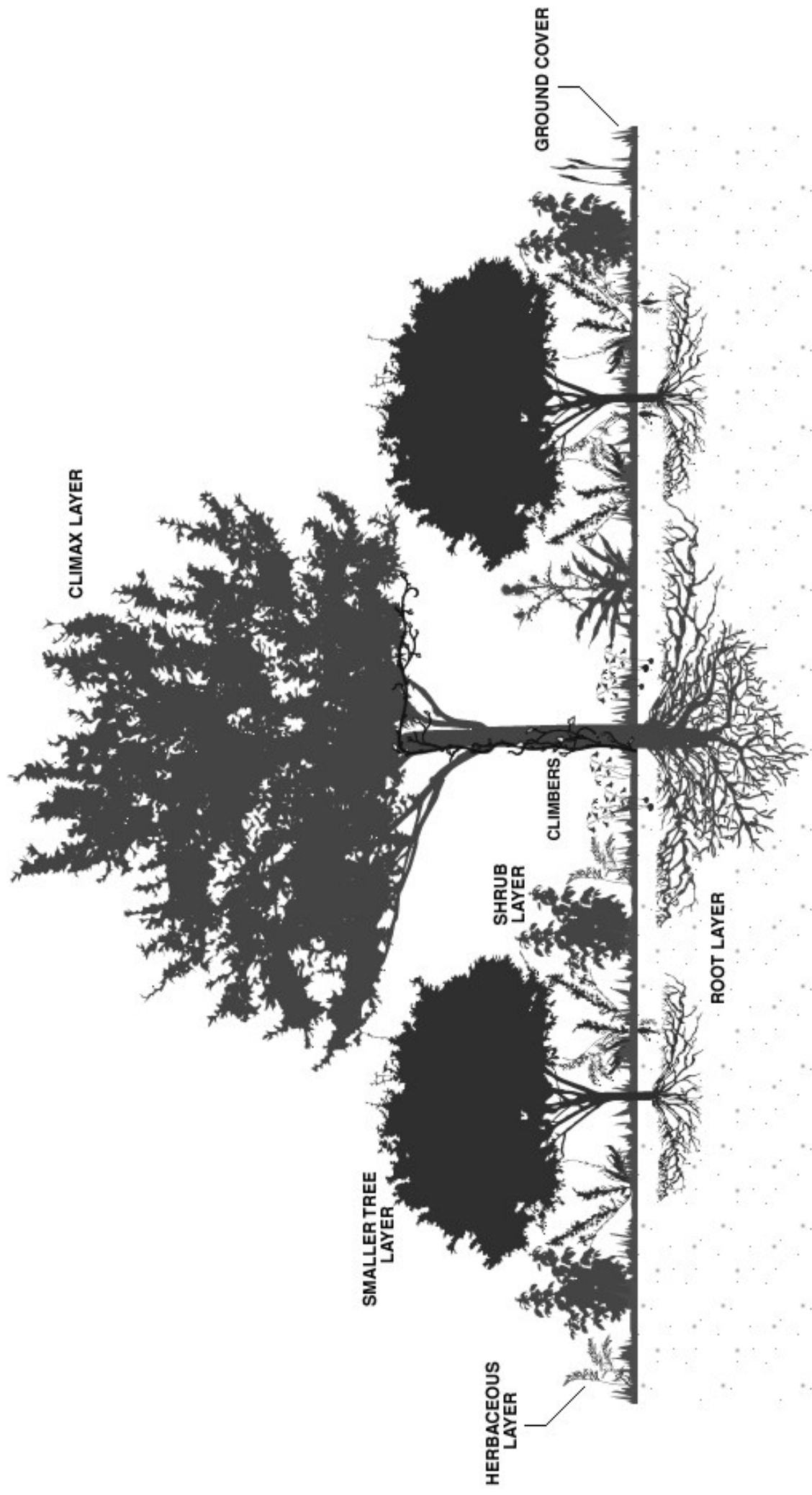
MAINTENANCE MULCH

Apply a mulch such as straw or well rotted woodchips around the base of the plant avoiding contact with the stem and leaves.



MODULAR PLAN





FOREST GARDEN PLANTS

Trees and large shrubs for sunny areas

Standard cherry – needs two to fruit, and is very attractive to birds. Cherries generally need to be netted in order to obtain a good crop.

Standard Apple – needs two in same pollination group to fruit. Apples flower slightly later than most other fruiting trees, and can be given a slightly less favourable spot unless other tenderer trees are not being planted.

Standard Pear – needs two in the same pollination group to fruit. Pears flower two weeks earlier than apples and so should be given a warm, sunny spot where they are sheltered from the wind and protected from frost.

Standard Plum – All plums blossom early, so they should be planted in areas where there is little chance of a late frost.

Walnut – Very large tree when mature. Frost tender, they need full sun and a warm, sheltered micro-climate.

Sweet Chestnut – Need two to fruit well. Very large tree when mature.

Medlars – Self fertile.

Large shrubs for semi-shade

Elderberry – Edible flowers and berries, leaves can be used as an insecticide and to remove heat from sprains and bruises. Flowers are an ingredient in quick return compost.

Hawthorn – Edible leaves and berries, medicinal uses as a heart tonic.

Hazel – Needs two to fruit well. Leaf litter is unusually high in plant nutrients.

Darwin's Bayberry – Edible berries

Heavy Shade

Morello Cherry – can fruit happily without direct sunlight. Self fertile.

Eleagnus – Nitrogen fixing evergreen shrub with edible berries.

Smaller shrubs for sunny areas

Rose

Rosemary

Sage

Lavender

Thyme

Raspberries – don't like being dripped on, so need to be out from under trees.

Shrubs for semi-shade

Blackberry

Blackcurrant – need at least half a day of full sun

Redcurrant

Whitecurrant

Gooseberries

Edible Honeysuckle – not a climber! Edible flowers and berries

Ramanas Rose

Nitrogen Fixers

Alder – Can be planted in between fruit trees to help in their establishment, and then coppiced to control its size and eventually removed once it starts to compete with the maturing trees.

Gorse – Nitrogen fixing shrub with edible flowers that also makes good animal fodder. Bees love the flowers. Will eventually be shaded out by maturing fruit trees.

Eleagnus – Evergreen, shade tolerant and with edible berries.

Larger plants for sunny areas

Borage – Edible flowers and great bee plant. Can be used medicinally as a hormone balancer

Globe Artichoke

Cardoon – similar to an artichoke but the stems are the parts eaten

Fennel – edible leaves, flowers and seeds.

Nine Star Perennial Broccoli – short lived perennial with edible leaves and flowers.

Perennial Kale – Edible leaves. These plants hardly ever flower so seeds can be hard to come by! Take cuttings from established plants.

Red Valerian – Edible leaves, and roots if cooked

Wild Cabbage – can be picked all year round

Smaller plants for sunny areas

Chives – Edible leaves, flowers and bulbs. Good companion plant. Can help to prevent scab in fruit trees. Anti-bacterial properties.

Daffodil Garlic – Edible leaves, flowers, and bulbs.

Everlasting Onion – Edible leaves, flowers and bulbs. Gives a moderate winter harvest.

Good King Henry – Edible leaves, flower buds, seeds and shoots.

Hyssop – Edible leaves and flowers can be used as a flavouring. Good companion plant.

Marigolds – Edible flowers, and very good companion plant to help keep away pests. Can make medicinal balms from the flowers – good for healing scar tissue and the skin generally.

Nasturtium – Edible leaves, flowers and seeds with a peppery taste. Makes great pesto! Can help to protect fruit trees from pests, and attract predator insects.

Rocket – Edible leaves, flowers and seeds.

Strawberry – also makes a good ground cover

Taller plants for semi-shade

Alexanders - Stems can be eaten like asparagus. All parts of the plant, including the flowers, can be used in salads. Does all of it's growing between autumn and May, when it either flowers and dies or retreats underground, making it an ideal forest garden plant for growing under deciduous trees.

Comfrey - Common comfrey is a native perennial plant which can be mildly invasive. It has many medicinal uses, it's main usage being in aiding wound healing and bone knitting. Russian comfrey is a hybrid, bred for it's uses as a dynamic accumulator. It is not as invasive as common comfrey, and contains higher levels of potassium and other plant nutrients than common comfrey, starts growing earlier and stands cutting better. Comfrey leaves can be used as mulch or compost material, and make an excellent plant feed, often combined with nettles. Both types of comfrey are excellent bee plants, and can be planted round the edges of the forest garden to keep out perennial weeds. Comfrey leaves can also be eaten and make good fritters, though can be a bit hairy for use as a salad vegetable for some palates. It can also be used as animal fodder.

Horseradish – Edible roots.

Jerusalem Artichoke – Edible tubers. Leave some tubers in the ground for a crop every year.

Lovage – Edible leaves, seeds and roots.

Rhubarb – Very deep rooted so do not plant near the base of young trees.

Stinging Nettles - These will probably turn up on their own and attempt to colonise the garden - they will out compete most vegetables, so may bring some weeding work but they do not need to be seen as a problem. They are an excellent source of mulch or compost material, and combined with comfrey make a nutritious (although smelly) liquid plant feed. They provide overwinter shelter for pest predators, and are an excellent wildlife plant. They also yield a green dye and can be used to make fibre for cordage or can be spun and woven into cloth. They are an excellent spring food plant, with the leaves being doused in boiling water to remove the sting and then used like spinach, or as an excellent soup, and the leaves can also be used to make leaf curd which is a highly nutritious source of protein. They have a cleansing action on the blood and are a tonic for the urinary tract, having a slight diuretic effect. The stings are also helpful for rheumatism.

Smaller Plants for Semi-shade

Alpine Strawberry – great ground cover

Daylily – Edible leaves, flowers and tuberous roots.

Sorrel – contains oxalic acid which gives it a lovely lemony taste, but eat in small quantities. Aggravates arthritis.

Hairy Bitter Cress – Not bitter or hairy! Has a lovely cress-like taste. Can be a ground cover

Jack-by-the-Hedge – Edible leaves with a garlic-mustard taste.

Lamb's Lettuce – Seeds germinate in autumn and grows steadily throughout winter. Mild tasting salad leaves.

Mints (various) – Can be mildly invasive and deplete the soil, but make great bee plants and ground covers.

Salad Burnett – Edible leaves.

Sweet Cicely – edible leaves and flowers. Can be cooked with rhubarb to reduce the tartness.

Smaller plants for heavy shade

Claytonia – Edible leaves

Dog Violet – edible leaves and flowers

Self-heal – Edibles flowers and young shoots. Good bee plant. Medicinal properties.

Wild Garlic (Ramsons) – Edible leaves and flowers with a strong garlic taste.

Groundcovers

Chamomile – makes a fragrant lawn.

Clover – Nitrogen fixing, edible flowers which bees love. Roots make a tight matt which will suppress weeds.

Yarrow – can be mown if needed, or be left to grow knee high. Edible leaves though strong tasting leaves.

All above ground parts can be used medicinally. Bees love the flowers.

ROOTSTOCKS

Apples

Rootstock	Habit	Size (in metres)	First Fruit	Main uses	Notes
MM111, M2, M25	Vigorous	6-8	7-8 years (standard 8-10)	Standard, half standard, espalier	Large on good soil, medium on poor
MM106	Semi-dwarfing	4-6	3-4	Bush, cordon, espalier, fan	Bush needs staking for first 4-5 years
M26	Dwarfing	2.5-4	3-4	Bush, cordon	Bush needs staking for first 4-5 years. Good on average soil
M9	Very dwarfing	2-3	2-3	Dwarf bush, dwarf pyramid, cordon	Needs good soil, and staking throughout it's life
M27	Extremely dwarfing	1.2-1.8	2-3	For very vigorous varieties, or very small gardens	Needs good soil, and staking throughout it's life

Pears

Rootstock	Habit	Size (in metres)	First Fruit	Main uses	Notes
Pear	Very vigorous	20	10-20	standard (other forms on poor soil)	The only one for poor soils
Quince A	Medium vigour	3-7	4-8 years from planting	Bush, cordon, dwarf pyramid, espalier	If in doubt, use it. Needs good soil
Quince C	Moderately vigorous	2.5-6	3-7 years from planting	Bush, cordon, dwarf pyramid, espalier	Only on the best soil

Plums

Rootstock	Habit	Size (in metres)	First Fruit	Main uses	Notes
Brompton, Myrobalan B	Vigorous	5.5-6.5		Standard, half standard	Too big for most gardens
St.Julien A	Semi-vigorous	3.5-4.5	3-6 years	Half standard, bush, fan	The usual choice for gardens
Pixy	Dwarfing	2.5-3	3-6 years	Bush, dwarf pyramid	Needs good soil and heavy feeding

FRUITING CALENDAR

January	February	March	April	May	June	July	August	September	October	November	December
	(forced)	Rhubarb									
			Eleagnus								
					Gooseberries						
					Wild & Alpine Strawberries						
					Sweet Cherries						
						Red & White Currants					
						Raspberries					
						Hybrid Berries					
						Blueberries					
						Wosterberries					
						Blackcurrants					
							Plums				
Pears								Pears			
								Blackberries			
								Apples			
								Autumn Raspberries			
								Sour Cherries			
								Ramanas Rose Hips			
								Mulberries			
								Damsons			

BIBLIOGRAPHY

Permaculture In A Nutshell By Patrick Whitefield

The Earth Care Manual by Patrick Whitefield

How To Make A Forest Garden By Patrick Whitefield

Forest Gardening by Robert Hart

The Permaculture Garden By Graham Bell

The Wilderness Garden By Jackie French

Plants For A Future By Ken Fern

The Fruit Expert By Dr D.G. Hessayon

The Salad Garden By Joy Larkcom

Good Enough To Eat By Jekka McVicar

How To Make A Wildlife Garden By Chris Barnes

Edible Plants For Temperate Climates By Martin Crawford

Design & Maintaining Your Edible Landscape Naturally By Robert Kourik (NB written for Californian climate but has many useful ideas)

Vegetables by Roger Phillips and Martin Rix

Wild Flowers by Roger Phillips

Trees of Britain and Europe by Roger Phillips

USEFUL WEBSITES

www.pfaf.org Plants for a Future online database

www.permaculture.org.uk The Permaculture Associations website

www.permacultureprinciples.com David Holmgren's permaculture principles

www.wildseed.co.uk Emorsgate wild seed company, excellent selection of native seed

www.users.tinyonline.co.uk/applewise Dolau-Hirion Welsh heritage fruit trees

www.cooltemperate.co.uk Cool Temperate Nurserys, good selection of plants for forest gardening

www.nickys-nursery.co.uk Another great source of seeds and plants

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